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THE CONVENTION.

THE twelfth annual convention of the Photographers' Association of America, held at Buffalo, July 14th to 17th, is now a thing of the past. Of the results achieved, the specimens shown, as well as the regular proceedings, will be found in another part of the JOURNAL.

We exceedingly regret that we were prevented from being present, unavoidable circumstances at the last moment necessitating our remaining at home, after all preparations for the trip had been made. The AMERICAN JOURNAL OF PHOTOGRAPHY, however, was ably represented by Thomas H. McCollin, Esq., our managing editor.

The best indications of the worth of an exhibition and the effect upon the general public is always to be found in the daily press. In view of this fact, we give a few extracts from the local press of Buffalo.

The picture-takers of America will be well represented in Buffalo to-day, as the twelfth annual convention of the Photographers' Association of America will be held here this week, beginning at 9 A. M. President Hastings, ex-President McMichael, and the officers of the association were kept pretty busy last evening in greeting the members as they arrived on all incoming trains. The vestibule of "The Iroquois" presented an animated appearance, and many pleasant scenes, as old friends recognized each other, were witnessed. President Hastings, attired in negligé fashion, assured everybody that the convention would be the most important yet held, and

also expressed himself as well satisfied with the outlook for the art display of photography. Not less than 600 delegates are expected. Many have arrived, and are registered at the various hotels, and the main contingent will arrive to-day. The convention will last four days, and will, unlike most conventions, be devoted chiefly to business.

The photographers are a well-dressed, fine-looking body of men, and although the program of public entertainment is not very extensive, they will doubtless find plenty of amusement during their week's sojourn in Buffalo.

The daily business meetings will be held in the main buildings of the Fair Association, and the evening sessions on Wednesday and Thursday will be held at Concert Hall. At the latter meetings some interesting, practical demonstrations of flash-light photography, with the aid of a stereopticon, will be given by prominent camera artists. Several very interesting papers are to be read by leading members, and an elaborate exhibition of photographic materials and appurtenances is to be held in the exposition hall at the fair grounds, beginning this morning.

But the principal feature of the meeting will be the art display in the art gallery at the fair grounds. Many fine prizes are offered to the competing photographers, and fine views have been sent from England, France, Germany, Canada, and many parts of the United States. It is expected that over 2,000 photographs, in all branches of the art, will be exhibited. The principal competition will be for the grand prize, the subject being Tennyson's "Elaine." The art exhibition will be open to members at 11 A. M. to-day, but will not be open to the general public till Friday.

The association was organized in Chicago twelve years ago, and has about 2,000 members. The officers are as follows: President, George H. Hastings, of Boston; first vice president, S. L. Stein, of Milwaukee; second vice president, L. Stuber, of Louisville; treasurer, G. M. Carlisle, of Washington, D. C.; secretary, W. A. Davis, of New York. All of the officers were at "The Iroquois" last night, and a meeting of the executive committee was held, at which the standing committees for the ensuing year were agreed upon, but the committees will not be announced till the convention meets.—*Buffalo Express.*

The wonders photography can achieve were never set forth better than they are at the national exhibition now being held at the Driving Park. No art has made greater strides in recent years than photography, and the fruits of all the ingenuity and study of countless craniums are here attractively arrayed. The photographs displayed cover every conceivable subject, and range in size from microscopic miniatures to imposing pictures more than six feet square.

The work of the most skillful operators from New York to San Francisco is to be seen upon the walls of the main building and art gallery. In the

latter the annual competition is in progress. This brings together some very rich and artistic work. The fanciful and character photographs, and the competitive illustrations of Tennyson's "Elaine," entered for a special prize, evoke warm praise and admiration. The exhibits of Eastman, Anthony, Schofield, Cramer, and other large manufacturers are showy and imposing.

About 300 photographers had arrived at the exposition building up to noon to-day. A doorkeeper guarded the entrance, and none could enter until he had seen the treasurer and propitiated him with a \$2.00 bill. The latter officer, being propitiated, handed out of his little box-window a receipt and a unique bronze button, bearing the effigy of a bison, which is to be the "open sesame" during the convention.

Soon after 9 o'clock this morning the first session of the convention was held in the little hall at the entrance to the building. President George H. Hastings, a Bostonian, with handsome, clear-cut features, was in the chair. A cordial address of welcome was delivered by Mr. H. McMichael, of Buffalo. Several of the "orders of the day" were postponed until later in the week. The selection of a place for the next convention was put off until to-morrow morning, and the appointment of a committee on nomination was deferred until Thursday.

Among the places proposed for the next convention are Detroit, Kansas City, and Denver. A western place will doubtless be selected.

The next session of the convention will be held to-morrow morning. "Color Photography" will be one of the interesting subjects to be discussed in the afternoon. Next Friday afternoon the exhibition will be open to visitors.—*Evening News.*

ELAINE THE FAIR.

Elaine the Fair, the Lily of Astolat, has been holding her court at the photographers' convention for the past three days. The illustration of Tennyson's sweet, sad heroine is the supreme test for this year of the more ambitious of the artists in the profession, and it has received elaborate and truly artistic treatment at many hands. Special interest is centred in this competition by reason of the fact that ex-President McMichael, of this city, is in the lists, and has striven to excel, if possible, the masterly work done in his "Enoch Arden" studies of last year. A few of the studies have had close attention from the chosen few who were permitted to see them in the past three days, and to-day the public are enjoying a view of these objects of the highest art in photography. It must be remembered that the artist makes his picture from the story as he reads it. The composition, the ideal of the characters, the expression, the sentiment, surroundings (except where history furnishes a background), light and shade, and all the infinitesimal, yet in a sense infinitely important, touches of the art which makes poetic

the commonplace and immortalizes painting,—all are his. In whatever degree he may have power, he makes the imitative art a creative art, and claims the immortality of genius.

The pathetic story of the sweet girl loved and abandoned by Launcelot, and dying for his love, is told in quotations attached to each set of the pictures. Beginning at the left of the exhibit of the Elaine competition, the first is No. 8, representing Elaine entering the hermit's cave on a visit to the wounded, but now fast recovering Launcelot, who "would listen for her coming and regret her parting step." The half-reclining Launcelot, the lovely, meek Elaine, and the praying hermit are extremely romantic and attractive. Equally attractive and graceful as the others in the set is the scene where Elaine

Now made a pretty history to herself
Of every dint a sword had beaten in it,
And every scratch a lance had made upon it,

as she carefully examined and mused over the shield of the unknown knight who rode away to the tourney with her favor bound on his helmet; and where the dead Elaine, after floating down the river on the barge, has been carried into the hall of the palace, and standing over her are the Queen, King Arthur, with Elaine's letter, and Launcelot, saying:

"I swear, by truth and knighthood, that I gave
No cause, not willingly, for such a love."

In the set No. 2 the first illustration is of Elaine by the gateway, watching the departing figures of Sir Launcelot and her brother, just visible in the distance. Other pictures in this group represent the forlorn, unloved Elaine, after Launcelot rode away the second time,—the days when she made a little song, "The Song of Love and Death." And the final one of this set is Launcelot seated beside the stream after the death of Elaine. The set is interesting, though Elaine wears a fifteenth-century instead of a fifth-century gown, and looks more like a lovely Marguerite. Launcelot's armor is represented by a sword and helmet. Without those he would be a better illustration of a "boy blue and his sheep" than of a brave and fearless knight.

The conception of the poem in set No. 12 is exceedingly artistic and attentive in detail. Love, Despair, and Death are the names of the three. "Love" represents Elaine's meeting with Sir Launcelot, where, visibly impressed, she stands gracefully conscious of his presence and of her love; "Despair," after the abrupt leave-taking of her hero-knight without bidding her farewell, or even an upward glance at her window; "Death" has come in the last of the set, and the father is placing in the dead Elaine's hand the letter she is to take to Sir Launcelot. "Despair" appeals to one

more than the others of these three illustrations,—she is so brave and sweet in her despair.

In set No. 5 Elaine, high up in her tower, guards the sacred shield of Launcelot left in her keeping. She is filled with wonder at the shield, and tries to unravel the mystery of the stranger knight. Alone again is Elaine, after Launcelot sent for the shield and rode away to King Arthur's court. In the death scene the figure of Elaine is extremely graceful and well posed.—*Evening News.*

THE PRIZE PACKAGE.—TWO BUFFALO PHOTOGRAPHERS PUT IN THEIR HANDS AND DRAW SOMETHING.

Before the photographers adjourned yesterday morning they thanked the press and the people of Buffalo for courtesies, and the outgoing officers for their hard work. They also concluded that \$1,000 was enough to expend for prizes and badges in 1893. Mr. Heimberger's election as secretary was made sure; Mr. G. N. Hurd, of Providence, R. I., read a poem; and the convention adopted a series of resolutions lauding the association, urging the formation of state and territorial organizations, and the affiliation of all such bodies now existing with the P. A. of A. An excursion to Niagara Falls in the afternoon was the concluding feature of the gathering. In the list of prize-winners, here given, will be found the names of E. F. Hall and H. McMichael, of Buffalo.

Grand prize, a group in bronze, with marble pedestal, "The Victor," value \$175—first prize, J. E. & A. J. Roesch, St. Louis; diploma—H. McMichael, Buffalo, three plain photographs, illustrating Tennyson's poem, "Elaine."

Class A.—A marble bust, value \$125; for the best exhibit of genre photographs—H. Randall, Ann Arbor, first; G. M. Elton, Elmira, second. Six photographs.

Class B.—One gold, one silver, and one bronze medal, for the best collection of portrait photography, size 14x17 inches, or larger—first, E. F. Hall, Buffalo; second, C. H. Rose, Providence; third, H. S. Bellsmith, Denver.

Class C.—One gold, one silver, and one bronze medal, for the best collection of portrait photography, size 11x14 inches or smaller—first, E. C. Dana, New York; second, Gilbert & Bacon, Philadelphia; third, G. Shellkell, Los Angeles.

Class D.—One gold medal, for the best collection of landscape photographs, with figures introduced—J. M. Brainerd, Rome, N. Y.

Class F.—One silver and one bronze medal, for the best collection of landscape photographs, without figures. No report. One silver medal for the best collection of marine views—H. G. Peabody, Boston, Mass. One

silver medal for the best collection of architectural views—C. C. Langell, New York.

Class F.—One silver and bronze medal, for the six best plain enlargements, either in silver, bromide, albumen, carbon, or platinum; the size not less than 18x22 inches—first, James Ingles, Chicago; second, Eastman & Co., Rochester.

Class G.—One gold medal to the operator making and exhibiting the three most artistic photographs; size to be not less than 13 or more than 22 inches in length—E. P. King, Providence, R. I.

Class H.—One silver medal to the retoucher for the best set of retouched negatives with prints from unretouched and retouched negatives—G. Weining, Providence, R. I.

Class I.—One silver medal to the printer for the most artistic printing, six prints to be exhibited—J. R. Lane, Columbus, O.

Class J.—One silver medal for the best improvement in photographic appliances introduced since the last convention—Automatic Printing Machine, K. & W.

Class K.—Three prizes to be awarded for the best foreign exhibit of portrait photography, framed or unframed—first to W. J. Byrne, Richmond, England; second, Mueller Munch; diploma to H. P. Robinson, Tunbridge Wells, for landscape work.

Air-brush painting for best portrait in black and white, to W. W. Sherman, Milwaukee; for best portrait in colors, Mrs. K. D. Saunders, Alfred Center, N. Y.

Cramer's exhibit for dry-plate work; best collection of portrait photography—P. H. Rose, Providence; E. C. Dana, New York; S. L. Stein, Milwaukee; for rapidity, J. C. Emmett, Brooklyn; for landscape, W. H. Jackson, Denver, Col.

Anthony prize for best work on N. P. A. paper—George A. Connor, head printer for Dana, of New York; for landscape work, to W. J. Harrison, head printer for Hargrave & Gubelman, New York.

Special diploma for sepia enlargements—Mr. Ingles, Chicago.—*Express.*

Post-Mortem Photography.—According to the *British Journal of Photography*, flash-light is now successfully used in photographing the dead, the artificial light overcoming the difficulties heretofore experienced in photographing a corpse. The editor states that he was "recently shown some very satisfactory results,"—of their kind,—obtained by this means.

HAND-CAMERA WORK.

BY XANTHUS SMITH.

JUST at this season, when so much use is being made of the small hand or so-called detective cameras, a few hints in regard to their use may not be out of place.

A good detective-camera worker should be like a good soldier or sportsman,—always cool and deliberate. He should not throw away his ammunition. I am inclined to think that there are full as many failures of the mark in hand-camera shooting, taking it collectively, as there are in a battle where the majority engaged are raw recruits,—that is, if the mark aimed at in working with the camera is the securing of fairly good pictures.

It should be the first business of the aspirant to success with a hand-camera to consider carefully what is really his aim in its use. Of course in its first form, as a nearly entirely concealed instrument, and when used as its name implies, solely for detective purposes, it makes little or no difference whether the results of the exposures are pictures or not, so that a good, clear likeness is obtained of the parties sought; but as the amount of genuine detective work is small indeed compared with that of viewing generally, and as more than half the hand-cameras used do not conceal the object for which they are used, it should be a matter of importance that the user classify the work to be done under different heads, and be prepared with some knowledge of what constitutes an attractive photograph.

After objects in motion, which constitute the most important work of the hand-camera, comes the getting of picturesque or interesting subjects which are so situated that the setting up of a tripod and making a time exposure is inadmissible,—such being buildings and character groups in towns and cities, and water views. Of course the former are much the most difficult subjects to manage, for in addition to the necessary perfection of the instrument there is the always troublesome matter of choosing a point which will give the best background, the best lighting,

the right distance, and, above all, the instant when the best movement is to be had. All those views that come under the head of sporting views—such as the race course and athletic ground furnish—should be relegated to those familiar with what is sought, as they will in every way be the best qualified to secure what will be the best understood and most acceptable to those interested in such matters.

To the large class, chiefly travelers, who are anxious to make the most agreeable pictures, we would chiefly address our remarks. Their aim should be to look out for the most characteristic living groups, buildings of historical interest or remarkable for their beauty or picturesqueness, and picturesque and agreeable water scenes and landscapes. Do not shoot away indiscriminately at anything and everything. It is an absolute waste of time and material.

In the landscape and architectural views, choose a good lighting, if you can, or let them alone, not only for your own credit, but for the credit of the scene. The light falling directly as you look will not give sufficient contrast and effect; and as instantaneous views are likely always to be undertimed in the shadows at best, do not look towards the light, or you will have a black, patchy, heavy picture.

In taking groups, especially of figures and animals, always think of what is back of them. It is the most difficult thing under the sun to get good, quiet backgrounds, especially in street scenes; and we are generally so absorbed in what we are immediately aiming at that we seldom ever think of what is back of it until our picture reveals the whole to us as a confused jumble, often absurd in its queer light and dark spots. If we perceive that a fine group is going to be swallowed up in this way by patches of black shadow in doors and windows, and streaks of white in walls and facings and awnings and awning posts, we had better let it alone.

In landscape and river work for shipping, especially the latter, it will be found of advantage to work where there is a great deal of atmosphere (murkiness or fogginess), as we will secure better perspective in the former and quieter backgrounds for our groups

of vessels in the latter. When you find that objects along a shore a half mile off are going to be stuck fast to your boats, let the whole business alone. In the real scene, the eye easily separates the distance from what is in the foreground, but cannot in the little photograph, the eyes necessarily being focused for all on the same plane.

For a great deal of hand-camera work there is no reason why as much care in selection of subjects, and in securing proper effects of light and shadow, should not be given as in taking views with a camera set upon a tripod; and if such care were bestowed there would be far less waste of films and plates, and a much greater proportion of amateur photographers whose work would be a genuine gratification when shown to their friends, and a source of happiness to themselves.

OPTICS IN CONNECTION WITH COLOR PHOTOGRAPHY.

HAVING received the important communication on "Color Photography" published in our last issue,¹ and having noticed in our patent intelligence in the early part of the year some applications for "Projections of Photographic Images in Natural Colors," by Mr. T. R. Dallmeyer, we had the pleasure of an interview with him last week, having heard that he had been working on what may turn out to be similar lines to those of Mr. Ives.

On meeting Mr. Dallmeyer he expressed to us his interest and admiration for Mr. Ives's investigations in the production, not only of color photographs, but also of his spectral analysis for producing upon the screen, by the use of color screens, the effects of photographs in their natural colors. Mr. Dallmeyer showed us the results of his investigations since last autumn in the production of optical apparatus to combine perfectly, by means of

¹ *Vide AMERICAN JOURNAL OF PHOTOGRAPHY*, p. 320.

the optical lantern, two or more images, to guarantee a perfect register in their coincidence. The methods employed by Mr. Ives, in the article contained in our last issue, are not fully described; but we are in a position now to account for work already accomplished in this direction.

Mr. Dallmeyer's attention has been confined solely to the optical side of the question. Last autumn he conceived the notion of taking separate images of a view on one plate, the various lenses acting independently and simultaneously with their colored screens; but for the time he gave up the notion of combining them, from the fact that they were not, in the first place, similarly disposed, and also, as we know, could not be made to overlap, in the true optical sense, when thrown simultaneously upon the screen.

In our columns early in the year, we published a communication from Mr. Albert Scott, the results of whose works were promised at a public meeting. Subsequently the *Optical Magic Lantern Journal* gave a detailed description of Mr. Scott's apparatus, and therein expressed that there was not a perfect or adequate optical coincidence of the various images. Mr. Dallmeyer had taken the subject in hand in order to attain this, and applied to the Patent Office for provisional protection. His process consists in taking the requisite number (three or four, as the case may be) of identical images upon one plate, projecting them through four lenses (not necessarily with which they were taken) upon the screen, the axis of each lens then being parallel lines. These multiple images are then brought into coincidence by one of two methods: the first, by placing an achromatic combination of lenses that cover the front combination of the three or four separate projecting lenses, of a focus equal to about that of the distance of the screen; the second, by applying three or four achromatic prisms of very small convergence in front of the said lenses. By this means a perfect coincidence of the separate images is attained. Another and pretty method is the application of prisms to a multiple diaphragm.

If a diaphragm with a number of apertures be inserted in a lens, and the focus of the lens taken, only one image, of course,

is formed. Mr. Dallmeyer's invention consists in not permitting the various cones of rays from the multiple diaphragm to meet at one focus, by inserting in each aperture a prism which throws three or more distinct images of the object focused for upon the one plate. This, of course, necessitates the employment of the lens with which they were taken as the projector; but, as the correction for an optical lantern lens and a photographic lens is one of theoretical more than practical importance, it carries but little weight. Object and image being interchangeable in a single optical system, we have here a method for optical coincidence of the images that is indisputable.

Whatever Mr. Ives's work has been in the optical arrangement of his projecting system, Mr. Dallmeyer and ourselves will be only too ready to welcome and give credit for; but, knowing that in this country we have workers in the optical direction, we take the opportunity of saying so.—*British Journal of Photography.*

[Mr. Ives states that the multiple diaphragm arrangement which Mr. Dallmeyer proposes is one that he carried out himself experimentally, but abandoned because it was practicable only for narrow angles of view, and with too small apertures to succeed with such plates as he uses. His own arrangement for landscape work permits of the production of three 2 1-8 inch pictures, each including over forty degrees angle of view, with an aperture of F 12 for the image of the red sensation, and with points of view not more than a quarter of an inch removed from a common centre. His camera for reproducing art objects includes a very much narrower angle of view, but makes the three negatives by simultaneous and equal exposure from exactly the same point of view, and with large aperture. His means for securing coincidence of images in lantern projection is new and ingenious, permitting of the utmost delicacy and precision of adjustment, with any screen distance, and without reducing the aperture of the projecting lenses. When returned from his summer vacation, Mr. Ives promises to prepare an illustrated description of his devices for publication in the AMERICAN JOURNAL OF PHOTOGRAPHY.—ED.]

TELEPHOTOGRAPHY.¹

BY M. GASTON-HENRI NIEWENGLOWSKI.

PHOTOGRAPHING at a distance, to which I will give the single name of telephotography, which is the most appropriate, comprehends two problems.

1. Given an object situated at a great distance (many kilometres) from the operator, but which may be seen by the help of a telescope,—to photograph it in such a way as to have an image large enough to see the details.

2. Given an object situated at a great distance, but not visible, either on account of intervening objects or on account of the great distance,—to photograph it.

The first problem solves itself easily by theoretical means. It is sufficient to work with an ordinary camera before the objective of which has been placed an astronomical or terrestrial telescope. One may see in *La Photographie Moderne* of M. A. Londe, a proof so obtained by M. Lacombe of Donjou de Vincennes, taken at a distance of two kilometres. But practically it is an affair of some difficulty. A telescope of any kind may be used. The draw must then be regulated in such a way that the instrument will give a true image for the last one. But if you use a terrestrial telescope, there is the glass of the objective, the four glasses of the vehicle for the transmission of the light, and lastly the two glasses of the photographic objective, making in all seven glasses. There is, in consequence, a loss of light by absorption, which increases considerably the length of the time of exposure. Besides, it is almost impossible, at least very difficult, to have seven glasses rigorously coincide on a single axis, and this defect of a want of coincidence produces aberrations that injure greatly the clearness of the image.

I have obtained very good results by setting aside completely the vehicle for the transmission of light. Nothing remains then

¹ Translated expressly for the AMERICAN JOURNAL OF PHOTOGRAPHY.

but the objective of this last, which gives a true image of the object to be photographed. This image is enlarged a little by the photographic objective if the draw is properly used.

I have been able to so obtain a proof four by five centimetres, of a château situated at a distance of a kilometre, which in a proof of the same place obtained directly by the camera was but two by three centimetres. The proof was lacking in clearness, which was undoubtedly due to a want of coincidence in the glasses. The time of exposure is not as much greater as might be supposed, because there remains but two or three glasses, according as the photographic objective is single or double, and the absorption of light is therefore quite feeble. Of course you cannot dream of an instantaneous view (at least with the sensitive preparations in use at present); however, on a clear day the length of exposure need not exceed a few seconds.

Not having had the time to make many experiments, I have been unable to study the variations of the time of exposure. It is evidently dependent, all other conditions being the same, on the obvious conditions of the distance and the state of the atmosphere. It should vary in an inverse ratio to the distance. In regard to the transparency of the air, it is difficult to study its actions; it is certain only that you cannot work except when it is quite clear. For dark times one should have recourse to the solution of the second problem, if it is in practical existence. But still it must be said that it will not answer perfectly the required end, for it demands a transmitting apparatus placed before the object to be photographed.

2. The solution of the second problem is theoretically possible; it rests on the properties of the electric current and selenium. Our first endeavor was to try to transmit the image directly to the eye,² but this met with great difficulties; the result was that it was desirable to replace the eye by a photographic plate, and we had then the problem as M. Brillouin gives it in an article to

² See Mathias: The Instantaneous Transmission of Images by Electricity. *Revue Generale des Sciences pure et appliquées*, December 1st, Vol. I., p. 798.

³ Marcel Brillouin: The Photography of Objects at a Great Distance by the Intervention of the Electric Current. *Revue Generale des Sciences pure et appliquées*, January 30th, 1891, Vol. II., p. 33.

which we recommend those of our readers who wish to have the details of the solution of this problem,—a solution too tedious and difficult to be given in full here.³

Any object whatever, landscape, figure, or picture, brightly lighted, is placed before a telescope, which projects a true image on a proper transmitting apparatus. The transmitter is connected by electric wires with a distant receiver, by means of which a true image like the one furnished by the objective at the point of departure is described in a few minutes on the surface of a photographic plate, which is afterwards developed in the usual manner.

However, such an apparatus has never been constructed. M. Brillouin thinks it may be realized by a careful constructor who has experimented. It is unnecessary to insist on the service such an apparatus would render to the police, military art, etc. We would like to remark that the first machine not requiring a transmitter before the object to be photographed might render much service to the military art; and it could be used immediately if one should have some plates sensitive enough to make instantaneous views. It is not necessary to add that we would like to combine the two machines, but it is yet but a dream. We must content ourselves with the hope that the apparatus as described by M. Brillouin will very soon be realized. The first is already practicable outside of instantaneousness. We would like to engage amateurs in the study of the first problem; there are some practical details the search for which will not be wanting in interest—*Photo. Journal, July, 1891.*

The following advertisement appears in the *Photographic Archiv*, No. 673, July 1, 1891:

"A born gentleman, 38 years old, of medium stature, heretofore an independent office-holder, but not altogether satisfied with his situation, amateur photographer and crayon portrait sketcher, seeks, from pure love of the art, a pleasant, wealthy lady (widows not excluded, nor is age material) who is in possession of a large photographic establishment, for the purpose of marrying the same. Honest proposals, including photograph, to be sent to 'A. B. C.', 3149, care publication office *Photographic Archiv*, Düsseldorf, Germany.

PRICES OF RARE METALS.

AS some of the rare metals of the platinum group are attracting more or less attention for photographic purposes, the following list, with prices attached, will prove of interest.

The rarest metal—and it is so rare that recent discoveries have thrown doubt on its elemental character—is didymium, and its present market price, if any one may thus term the quotation of an article that never appears on the market, is \$4,500 per pound. The next costliest metal is barium, an element belonging to the alkaline earth group; its value is \$3,750. Beryllium, or glucinum, a metallic substance found in the beautiful beryl, is quoted at \$3,275. Yttrium, a rare metal of the boron-aluminium group, so called because first noticed at Ytterby, in Sweden, is stated to be worth at present \$2,250 per pound. Niobium, or columbium, a name suggestive of the American origin of the metal, it having been first discovered in Connecticut, is valued to-day at \$2,000 per pound. The price of rhodium, an extremely hard and brittle substance, which owes its name to the rose-red color of certain of its solutions, is also \$2,000. Vanadium, deriving its title from one of the appellations of the Scandinavian goddess, Freya, and at one time considered the rarest of metallic elements, has been reduced in price to \$1,775, at which value there will no doubt be many eager buyers. Iridium, a very heavy metal of the platinum group, so named from the iridescence of some of its solutions, and well known in connection with its use for the points of gold pens, may be bought to-day at approximately \$700 per pound. Osmium, another metallic element of the platinum group, is hard, infusible, and the heaviest substance known. Its present value is \$625 per pound. Palladium, a silver-white, fusible metal used in the manufacture of certain parts of time-pieces, and occasionally applied in dentistry, is worth \$500 per pound. The present price of platinum, the better-known tin-white, ductile, but very infusible metal, is on a par with that of gold,—viz., about \$350 per pound.

PHOTOGRAPHIC FRAUDS.

THERE are two barnacles which have engrafted themselves upon photography, and have done much damage to the honorable craft at large. We allude to the "free-for-nothing crayon sharper," and the so-called "Grecian" or "Egyptian photographic artist." Their victims are mainly to be found among the poor and ignorant in the cities, and the rural classes at large throughout the country, neither of which can well afford to lose their hard-earned money.

Fortunately there seems to be a disposition of late, on the part of the authorities throughout the country, to stamp out these fast-growing swindles. Few things afford us greater pleasure than when we can chronicle the fact that another of these frauds has been brought to justice or foiled in their swindling practices, and their methods of gulling the public exposed. During the present week we find in the daily papers reports of three cases, in widely separated cities, where the swindlers have been made to feel the strong arm of the law.

The first of these cases, which we clip from the *New York World*, July 17th, 1891, we reprint in full as a warning to all concerned. This is by no means an isolated case, nor is the practice confined to New York city alone.

The profound secrets of arts Egyptian, which were in danger of becoming public property in the plebeian civil court-room of Justice Neu, in Brooklyn, remain locked in the breasts of a favored few.

A suit was brought recently by William Clayton Laws, who for several years has practiced what is known as Egyptian art painting. Laws calls himself an artist, and he demanded judgment in the sum of \$25 from Anton Thursby. Thursby is a well-known local chiropodist, whose parlors are at No. 7 De Kalb Avenue. His prepossessing wife, a native of Scandinavia, presides over a well-kept tonsorial establishment adjoining. Laws had been a frequent customer at the little barber shop, where Mrs. Thursby regularly lathered and scraped him.

He wanted to teach her his art. He would only charge \$25, and would give the first lesson for nothing. Mrs. Thursby agreed.

Here is a copy of the complaint as drawn by Lawyer De Fere, Law's counsel:

First—That he is and at all times hereinafter mentioned was an artist and a professor of the various arts of painting.

Second—That on or about May 29th, 1891, at the defendant's (Thursby's) special instance and request, he gave to said defendant's wife and to his son instruction in the Egyptian art of painting, and disclosed to them the secret processes and formulæ of such art, and that the defendant agreed to pay the plaintiff therefor.

Third—That the fair and reasonable value and usual price for said instruction is \$25, and the defendant refuses to pay the whole amount or any part thereof, whereof plaintiff demands judgment, with interest and costs.

Upon the receipt of the above Thursby employed Z. W. Butcher to care for his interests. The answer which he filed, of which the following is a full text, staggered Lawyer De Fere and his client. The former withdrew.

First—The defendant, not having any knowledge sufficient to form a belief, denies that the plaintiff Lewis is, and at all the times hereinafter mentioned was, an artist and professor of the various arts of painting.

Second—Defendant denies that on or about May 29th, 1891, the plaintiff gave to the defendant's wife or his son instructions in the Egyptian art of painting, and delivered to them the secret processes and formulæ of said art, or that the defendant agreed to pay plaintiff therefor.

Third—He denies each and every allegation contained in the plaintiff's complaint.

Fourth—And this defendant for further answer states: That this plaintiff came to the defendant's store about the time stated in the complaint, pretending to possess a secret in the art of Egyptian painting. He exhibited what he represented to be a sample, and stated that he would instruct the defendant's wife and son until they should be fully conversant with the processes for \$10, and would not demand any money until they were instructed, and, furthermore, would give an experimental lesson without compensation.

Fifth—That, relying and trusting upon the plaintiff's statement, and believing the same to be true and not otherwise, the defendant consented to have his wife and son witness the experimental lesson; that instead of giving said lesson the plaintiff went to the defendant's residence, and produced the photograph of a nude female, whereupon defendant's wife resented such insult, and informed him of the same. The said plaintiff took up the said paper, tore it in pieces, and took it away with him.

Sixth—Defendant states this is the only art, be it Egyptian, French, or any other art, in painting ever given to this defendant's wife or son, and for which the plaintiff demands \$25.

The fifth clause threatened serious complications and scandal. Mr. De Fere, the Egyptian artist's counsel, declared he would proceed no further. He did not; and as the complainant did not appear, Justice Neu dismissed the complaint.

Mrs. Thursby says Law's conduct toward her was anything but gentlemanly. The one experimental lesson she said was enough for her. Her boy was also supposed to receive the same instruction. After Laws had transferred a photograph of an actress in scant attire to a concave piece of glass, and started to tint the same, he sent the boy from the room. When they were alone she claimed that Laws drew from his pocket several questionable photographs. He then pretended to discuss the artistic points of the subjects. Mrs. Thursby objected, and started to call her husband. He entered at that moment. Laws hastily concealed the photographs beneath the table, and tore them up. His stay was brief, and it was not till he had gone that she told her husband.

Laws returned a few days later and demanded money. He came again, asking trust for a shave. He was refused. He next came to the place and asked for the loan of a dollar. Again he was refused, and then he threatened suit.

Laws is said to be well connected, a near relative of the Attorney General of Maryland, and a member of a respectable family of Atlanta, Ga.

The usual method of these "Egyptian" or "Grecian" artists is to rent a room on a prominent street, exhibit a few highly colored photographs, usually of the variety-actress type, while a glib-tongued barker, of the "street-fakir" order, distributes a seductive dodger which sets forth that lessons are here given in the old, long-lost Egyptian process, which was lately discovered in the pyramids, for turning photographs into Messonier miniatures, "and all for three dollars, ladies and gentlemen."

The dodger also sets forth that "the process is simple, and can be easily learned by any one in one lesson. No previous knowledge of drawing or mixing paints required."

Thus it goes on, day after day. The innocent victim who enters the den is charged three dollars for the "secret," then often roped out of all he has got for so-called artists' materials and specimens to practice on. It is needless to say that the whole thing is a loss to the victim.

The other two cases are somewhat similar. Both are exponents of the crayon game. The first quoted is from the Philadelphia *Ledger* of July 18th, 1891.

CRAYON PORTRAITS.—AN ALLEGED AGENT ARRESTED ON THE CHARGE OF SWINDLING.—Charles A. Radue, alias Charles McIntyre, who resides on Howard Street, above Master, was arrested by Policeman Miller at Broad

and Moore Streets yesterday, and locked up in the twenty-sixth ward station, charged with swindling and obtaining money under false pretences.

It is alleged that Radue has gone to a number of residents in the lower section of the city, and represented himself as an agent for Thompson & Co., of Fourth and Market Streets, and that he would offer to have a crayon portrait of a person taken for \$4.00 on the payment to him of 50 cents.

The number of people who called on the firm, demanding their portraits, was so large that they were compelled to advertise that no person had the right to take orders for them, and that all such were frauds. The advertisement was seen by James E. Henderson, of Broad and Moore Streets, and, while Radue was plying his illegitimate trade yesterday, Mr. Henderson caused his arrest. Last evening over thirty persons called at the station and identified Radue as the man by whom they were swindled.

The next case comes from the staid old city of Lancaster, in Pennsylvania.

PHILADELPHIA AGENT ARRESTED.—HE WORKS AN OLD PHOTOGRAPH SCHEME ONCE TOO OFTEN.—LANCASTER.—Bernard Hamer, representing a Philadelphia portrait-enlarging house, was arrested here to-day, charged with larceny as bailee of two photographs.

Hamer secured the photographs by promising to make large crayon portraits without charge, but rendered the bill for the frames, and refused to surrender the photographs unless the frames were paid for. The scheme has been worked extensively in different parts of the country. Hamer gave bail for a hearing.

Thus it goes on. Let the good work continue until all photographic frauds are stamped out, and the "crayon sharp" becomes an extinct species, a thing of the past, existing only in tradition.

Personally, we could never understand why people would listen to a glib-tongued stranger, and part with their money, in preference to patronizing their local photographer, who is known to them, and in most cases prides himself on the quality and excellence of his work. It should be remembered that no traveling agent can offer any advantages over the local photographer. Nor has he the interest of the community at heart, like the man who lives within their midst. It costs money to travel from place to place, and under any and all circumstances the buyer is expected to pay these expenses; if not in one way, he does it in another.

The frequent exposition of these sharpers and their methods in the daily press should be sufficient warning to all persons in city and country to give them a wide berth, and stick to home talent, where they have redress if anything does not prove satisfactory.

However, to such as will not be warned,—they deserve no pity.

J. F. S.

AN AMATEUR'S EXPERIENCE IN INSTANTANEOUS PHOTOGRAPHY.

BY WILLIAM H. SEAMAN.

IT is generally foolish for a beginner to rush into print; and as I have just completed my first serious work in this line, I consider myself a beginner. But as the Bausch & Lomb premiums are adapted to cause much interest in instantaneous work among amateurs, I relate my "experience" in the hope of exciting others to do likewise.

The first question is: What is the longest exposure permissible to have sufficient sharpness to obtain a satisfactory picture with the usual rate of movement of men and animals in street scenes? These are frequent subjects of instantaneous work.

If the objects are more than ten metres distant from the lens, 1-25 second may do; if nearer, only 1-50 will answer.

I have not studied the effect of different stops; this statement relates to full aperture.

Instantaneous work is underexposed; the usual fault is want of density in the negative. Many who can make a good picture do not seem able to tell how they do it. It is difficult to find, from the numerous articles on the subject, if a weak or a strong developer should be used on underexposed plates. To stimulate discussion I assert that no underexposed plate (this, of course, includes all instantaneous work) can be brought up to full density without a strong developer. The immediate application of this to the plate is dangerous, involving the possibility of suppression of detail. Often descriptions begin by stating that a

weak solution is to be used first; "then" (I quote) "throw in a pinch of pyro."

Now if you have several plates to develop, your bath is no longer in condition for the next plate, and you must start anew, at the cost of much waste of solution.

I take five trays. The first contains a five per cent. solution of potassium carbonate; the second, my standard developer, with one-third more water; the third, standard developer; the fourth, Carbutt's alum solution; the fifth, hypo.

Seed plates, No. 27 sensitometer, exposed 1-25 of a second, in good light; develop well by laying one minute in tray No. 1, three minutes in No. 2, one minute to one and one-half in No. 3, one minute in No. 4, and in No. 5 till silver is gone,—five to fifteen minutes. No. 1 may be omitted; but I have thought the pictures were clearer for it. My standard solution contains one per cent. of eikonogen, one to four per cent. of hydrochinone, five per cent. of sodium sulphite crystals, 2.5 per cent. of potassium carbonate. No bromide is required.

I count my time in the trays, and do not take out of the developer, if I can help it, till the action is nearly complete. In tray No. 2 the image should just fairly appear when the plate is taken out; then it must be carefully watched in No. 3, or it will over-develop. By using the two different strengths of developer, you can go right along and adapt the development to the character of the plate, without altering the developer, and thus keep it in good condition for any number of plates.

The Gundlach Optical Company, of Rochester, N. Y., has just moved into a fine new factory building at 171 and 173 Pinnacle Avenue. The company erected this building during the spring months, and it is now entirely fitted up for their use. No pains have been spared to have the arrangements as complete as possible, and all the appointments and facilities are as complete as can be obtained. In fact, no factory in this country or Europe is in better condition for the manufacture of high-grade optical instruments. The recent improvements in the photographic lenses made by the Gundlach Optical Company have won for them a place high up in the estimate of all photographers, and it is with pleasure that we note this evidence of their prosperity. Long may it continue!

A TORONTO PHOTOGRAPHER'S HAZARDOUS FEAT AT NIAGARA.

THE nervy Toronto photographer, A. J. Dixon, gave an unparalleled exhibition of gameness at the suspension bridge at four o'clock yesterday afternoon, by walking on a cable stretched across the gorge above the whirlpool rapids. The cable, seven-eighths of an inch thick, was 700 feet in length, and Dixon accomplished the feat of walking its entire length from the Canadian to the American side in just $15\frac{1}{2}$ minutes, this time including four stops, during which he performed a number of hazardous antics. The cable used yesterday was the same one used by Dixon last summer, when he crossed the gorge at a point midway between the cantilever and suspension bridges, but it was not nearly so well guyed yesterday, and sagged fully twenty feet in the middle. The heat, too, was intense, and the terrific roaring of the rapids also tended to increase the peril of the daring man. He was prevented, first by trickery and then by entreaty, from recrossing the river.

The affair was the sensation of the summer at Niagara, and every train brought hundreds of spectators. A large party from Toronto came by special train, and the Photographers' Association of America attended in a body, adjourning their session in Buffalo in time to witness their fellow-member's perilous performance. The Catholic Benevolent Legion had an excursion to the Falls, and nearly all witnessed the wire-walking act. The hackmen—a few relics of the past—enjoyed quite a harvest, and all of the familiar touch-penny devices were worked with a will by the money-making denizens. The Whirlpool Rapids Park enjoyed a great boom, for one end of the cable terminated at this point. The admission fee to this place was twenty-five cents, and fully 2,000 persons paid this price very willingly. Less advantageous places along the river were fenced in, and the owners reaped a silver harvest. The suspension bridge was crowded, and proved to be a very good place of observation. The Canadian side was swarming with men, women, and children, and the crowd numbered fully 10,000 persons.

Punctuality is one of Dixon's strong points, and shortly before four o'clock he appeared on the Canadian side. He was accompanied by his daughter Etta, fifteen years old, who had a large bundle of photographs of her father, and disposed of them like hot cakes. On the American side Dixon's wife and second daughter, Miss Ella, aged thirteen years, were acting very nervously in Whirlpool Park. When Dixon appeared ready to start on his trip, Mrs. Dixon became hysterical, and was soothed by sympathetic women present. It was a very trying ordeal for her ; but after it was all over, and her husband was the lion of the day, Mrs. Dixon was the proudest woman in the great crowd.

Promptly at four o'clock Dixon took his balancing pole,—three sections of two-inch gas-pipe, about twenty feet in length,—and waving his cap to the people on the American side, started out on the cable. He was gayly costumed, and looked quite attractive.

Dixon is a man of fine physique, swarthy in appearance, with a dark mustache. His tights were flesh-colored, ornamented with heavy garters of black and gold fringe. His girdle was gorgeous with a combination of red and gold on a ground of black, and around his neck was a similar "work of art." A jaunty military cap set off his picturesque garb to perfection.

When out from the palisade about fifty feet Dixon calmly reassured his almost breathless friends and admirers that he was "all right" by squatting on the wire. A little farther out he sat down and put his legs over the balance-pole, and by pulling a couple of strings long streamers of red, white, and blue ribbons floated out from either end of the pole. The crowd yelled its approval, and then the venturesome fellow resumed his journey. When midway over, he again rested, and amused himself and the crowd by a number of tricks. At this point he tied his handkerchief to the cable, intending to get it on his way back, but it probably floats in the same spot to-day. The people on the American side, as the hero of the occasion approached, were warned not to be demonstrative until he reached terra firma, as applause might unnerve him. The warning was heeded.

When Dixon landed on the flimsy platform on this side of the great gorge, he was most enthusiastically received, and his balance-

pole came near falling over the precipice during the excitement. A tremendous shout went up, and was reechoed from across the river, and a regular "Chautauqua salute" was given on the Canada side. Dixon's friends made a mad dive for him, lifting him bodily up in the air, and in this manner he was borne on the shoulders of several stalwart fellows to a refreshment booth near by. Another portion of the crowd scrambled wildly for the ribbons attached to the balance-pole, and the ribbons were soon cut into a thousand pieces. Dixon was roughly handled by the crowd, everybody being anxious to shake hands with him. His little daughter Ella ran through the crowd crying "Papa, papa," but came near being badly crushed, and was led away to her mother.

To an *Express* reporter who greeted Dixon just after completing his risky walk, he said: "That was the hardest job of my life. The walk over the river last year was easy to this one. The cable was not guyed properly, and the river at this point is terrible. I didn't dare to look down at the rapids."

"Do you intend to give other exhibitions of the kind here?"

"Yes, I intend to walk over four or five times if I can make suitable arrangements. But there is no money in this performance of to-day."

During Dixon's sojourn with his friends at the refreshment booth an enterprising museum man had seized the balance-pole carried by Dixon, and walked off with it. The crowd yelled to Dixon not to recross the river.

"Well, if you're satisfied, I am," answered the wire-walker; "but I'm going to perform a few tricks on both sides."

"No, no," yelled Dixon's friends.

Dixon is a most impulsive man, and immediately jumped away from his friends, and ran in search of his pole. Of course he couldn't find it. Then he declared that he would go out on the cable without the pole unless it was produced forthwith. The pole was finally secured, and renewed attempts to dissuade him from carrying out his intention proved unavailing. Finally, after about half an hour's rest, Dixon went out about fifty feet on the cable, tied the pole to the cable, and executed a number of clever

acrobatic feats on the wire. The most daring act was to hang to the cable by one hand. He then came back, bade adieu to his friends on the American side, and entering a carriage was driven across the bridge, where he joined the crowd on the Canadian side. Without a pause, he again walked out on the wire, and repeated his acrobatic exhibition. He received a very warm reception at its close, and was then driven to a hotel, where he was joined by his family and intimate friends.—*Buffalo Morning Express, July 18th, 1891.*

NOTES ON PERSPECTIVE DRAWING AND VISION.

BY DR. P. H. EMERSON AND T. F. GOODALL.

SOME years ago we made some experiments with the object of comparing a monocular perspective drawing with the drawing of an aplanatic photographic lens. We found that under similar conditions they were alike, as was, of course, *a priori*, probable. More than a year ago one of us published a short paper with an experiment, which threw grave doubts upon the truth of perspective drawing when compared with what the eye really sees.

We now offer a series of provisional propositions, experiments, proofs, and deductions, which we venture to think are of fundamental importance to all artists, as well as to physiologists and psychologists. We are working now to still further elucidate the matter; but we decided to publish the following notes, so that specialists might perhaps help us in the matter.

Our experiments and deductions, if correct, will show that for scientific reasons the accepted rules of monocular perspective are likely to mislead the artist, and prove the fallacy of photographic and all mechanical methods of measurement.

Proposition A.—The eye does not constitute a symmetrical lens, the top and bottom¹ portions being different. That portion

¹ We have ignored, for the sake of simplicity, the optical law of inversion of the image on the retina; when that is considered, the terms "upper" and "lower" must be merely interchanged.

of the eye which perceives distance and distant objects (*i.e.*, those above the ground) sees the objects on a larger scale than the portion of the eye which views the foreground on nearer objects; therefore our impression of nature is not what we get with a mathematically correct perspective drawing, or the drawing of an aplanatic photographic lens. That is, a perspective drawing surprises us by making the foreground objects look larger in proportion to the distance. Also, we see a larger arc with the lower half of the eye than with the upper.

Proof 1.—That we do not see the same amount with both halves of the eye (upper and lower) is proved by the observer lying on his back and looking straight up at the sky, when he will find that the field of vision of the upper half is much more limited than the space seen by the lower half of the eye. This holds for either one eye alone or for both when used together.

The proof is completed when we stand with our legs apart, and, standing with our back to the landscape, bend down and look between our legs. Here the fields are inverted, and consequently the distance appears small and far off, and gives much more the appearance of a sharp photographic rendering of the scene. This peculiar effect has long been well known, and it has puzzled a good many observers, but hitherto no valid scientific explanation has been offered.

Proposition B.—We think this may be the result of the naturally selective action of the retinal nerves. It has been to our advantage in the struggle for life to see all the objects near to us and close around clearly, and to compass as wide a field as possible. It has also been to our advantage in the struggle for life for certain parts of nerves to try to draw distant objects nearer and to enlarge them, so that special functions may have developed purely by natural selection.

Deduction 1.—That mathematical perspective drawing gives quite a false impression of what we see when using *either one of our eyes or both.*

That such is actually the case we will now endeavor to prove, at the same time still further supporting our contention that the

upper and lower portions of the eye see objects in different perspectives.

Proof 1.—Let the observer select a church-tower or tall chimney for experiments. If the sides are parallel the object will appear to his eye wider at the top than at the bottom, when he stands facing it at the distance of the tower itself and looks steadily at its centre. These experiments are best made in the diffused light of evening. The experimenter must not move his eyes up and down the tower from top to bottom, and so measure or correct his impressions, but he must look steadily at the centre of the tower, and take his pure sensuous impressions. As most towers and chimneys do taper considerably, the result the observer gets when close to them is that they look parallel, or nearly so. This fact was, no doubt, felt by the architects of the Parthenon, and it has never been known why they built the columns leaning inwards, a little out of the perpendicular. That they were built out of plumb has been proved by measurement, that they look parallel is well known, and the reason of this we venture to find in our proposition.

Proof 2.—A very simple proof is to look about the middle of a doorway or door; it will be felt that the door or doorway is wider at the top than the bottom. The same holds with books in a bookcase.

Proof 3.—Cut two slips of paper,—(a) 8 inches long by 2 inches wide, (b) 8 inches long by 2 inches by $1\frac{1}{8}$ inches wide, so that it tapers $\frac{1}{8}$ of an inch.

If the parallel slip (a) be held upright eight inches from the eye (its own length), and looked at straight in the centre (the centre of the paper being opposite to the eye), the paper will appear slightly wider at the top than at the bottom, the same proviso of not correcting the pure impression by measurement (looking up and down it) holding as we pointed out in the case of the church-tower.

If the observer now takes the tapering slip (b), and holds it narrow end upwards, looking at it in the same way, it will appear parallel; if he hold it wide end upwards, it will appear much wider at the top than at the bottom.

This holds equally true if the experiments are made either with one eye or both, showing that binocular vision has no effect on the impressions.

Proof 4.—Another interesting experiment is to place a penny upright on a table, and a halfpenny 18 inches behind it, and a little to the right or left of the penny. The eye must look *over* the penny at the halfpenny, so that the penny is a foreground object, and the halfpenny a distant object. If the observer now looks steadily at the halfpenny, at the same time seeing the penny he will find the impression given is that the halfpenny looks nearly as large as the penny.

Proposition A and proofs deal mainly with what we would describe as *vertical vision*,—that is, with the variations in the appearances of objects when placed one over the other, as in a vertical column, or with objects at a distance as compared with objects in the foreground.

But within the radius where binocular vision acts (calculated by Mr. T. R. Dallmeyer to be 60 yards) new and important variations occur. These properties we shall consider under the term of horizontal vision.

Proposition.—Within the limits where binocular vision is effective (say normal vision, 8 inches to 60 yards) objects *appear smaller when they are compared with objects beyond the binocular limit*,—that is, they appear smaller as compared with drawings as given by monocular or mathematical perspective.

An experiment to practically bring the effect of the binocular vision variations entering into the matter may be made as follows:

Take the tapering slip of paper aforesaid (*b*), and place it between the two eyes, the wide end resting upon the bridge of the nose, the slip being inclined at an angle of 30° with the horizon. The result is that the paper vanishes *towards* the eyes,—diametrically an opposite result to what perspective would lead us to expect. This phenomenon still holds if the paper be gradually moved away from the eyes, and held at arm's length, but in the same plane.

Proof.—Place a book at a distance of six feet from the eyes. Then proceed to measure the width of the book with a pencil (one eye being closed), as a draughtsman draws objects by monocular perspective, and then open the other eye and measure the width of the book with both eyes; the binocular measurement will be found to be smaller than the monocular measurement. If the height of the book be measured in the same way, there will be no difference in the result obtained with one or both eyes.

But more convincing is Proof 2. Wafer a square sheet of white paper (say eight inches square) on the wall or window, six feet from the observer, and look at it. The impression given will be that it is larger vertically than it is horizontally. This explains the old trick of marking off the height of a tall hat against a wall. As a rule everybody places the mark too high; the reason is now explained.

Still another proof. Stand a halfpenny and penny on the table, as directed in the previous experiment. Now place the eyes on the same level as the plane of the table, and observe. The result will be exactly the reverse to that previously obtained,—that is, when looking directly at the halfpenny, at the same time looking indirectly at the penny, the penny will appear the larger; and *vice versa*, when looking directly at the penny and indirectly at the halfpenny, the halfpenny will appear nearly as large as the penny.

Another every-day proof. Let a person sit in one end of a long punt with parallel sides, and look at the other end; it will look to him to be wider than where he is, and yet its sides will by perspective laws vanish quickly away from him.

These proofs show the effect of binocular vision, which is to increase the appearance of height and to narrow the appearance of breadth, consequently it makes objects appear taller than a perspective drawing would do.

Deduction.—The reason we get a different impression of relative sizes of objects by normal vision from that given by mathematical perspective drawing and photographs is that the combination of these properties of vertical and horizontal visions give quite a different result to that of perspective drawings.

Final.—Having shown how we see forms, it only remains to say that a mathematical perspective drawing, or the drawing of an aplanatic photographic lens, does not give forms as we see them. They are altogether false to the visual impression of the proportions of things, and therefore give a wrong idea of the original scene. On the other hand, a perspective drawing or correct photograph gives the *actual facts* scientifically,—*i. e.*, the pillars of the temple as leaning, the paper in experiments as *square*. All such drawings are, therefore, purely scientific diagrams, and artists who wish to render what they see must not rely upon them.—*Photography.*

A NEW PHOTOGRAPHIC OBJECTIVE.

BY ERNST GUNDLACH.

IN view of the rapid and continually increasing succession of inventions and improvements made in all branches of photography, and of the important part which the objective plays in the progress of the art, it is a surprising fact that, since the appearance of Steinheil's "Aplanat," so many years ago, no real optical improvement has been made in the construction of photographic objectives, but that, despite the constantly increasing demand for a better lens, the principle discovered by that eminent optician, and the particular type of objective based on that principle, steadily remained the standard in the manufacture of photographic objectives since its first introduction and up to the present time. In view of this remarkable fact, the writer takes particular pride in presenting herewith to the photographic and scientific world a description of a new objective, which, after long and most ardent endeavor to perfect, is now deemed ready to be submitted to the criticism of the interested scientist, and to the practical trial of the intelligent photographic worker. This is done with the full belief that this invention will not only be generally accepted as an essential and valuable contribution to real progress, but that it also may serve to incite the minds of inventors to new ideas and further improvements.

The invention and its principle is of a purely optical nature, and consists of a successful transformation of the Steinheil achromatic double meniscus—the constituent of his "Aplanat"—to a *triple* meniscus of novel and peculiar form, the theoretical principle and great practical advantages of which are as follows:

Owing to the fact that the ratio of the color-dispersive power of flint glass to its medium refractive power is *greater* than that of crown glass, an *achromatic* lens is produced by the combination of a positive



Fig. 1.



Fig. 2.



Fig. 3



Fig. 4.



Fig. 5.



Fig. 6.

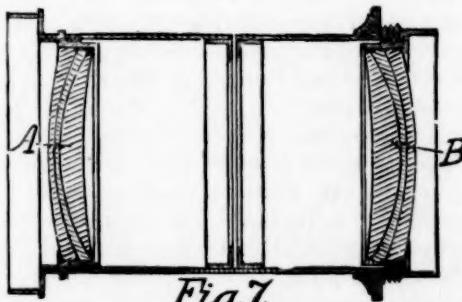


Fig. 7.

crown-glass lens with a negative flint-glass lens, the dispersive power of which is equal in amount to that of the crown-glass lens, for with equal amounts of dispersive power the medium refractive power of the

crown-glass lens is *greater* than that of the flint-glass lens, and the preponderant part of that of the crown-glass lens forms the positive focal power or focal length of the combination, thus being the true constituent of the achromatic lens. (Focal power is here termed the magnifying or reducing power of a lens as expressed by the reciprocal value of its focal length.) Now it is obvious that the greater the dispersive power of the flint glass employed the lower a focal power of the crown-glass lens will be required for a given focal power of the combination or achromatic lens, and consequently the smaller will be the amount of color-dispersion to be corrected by the flint-glass lens. Furthermore, regarding the established fact that in an achromatic lens neither the spherical nor the chromatic aberrations can be completely neutralized, but that more or less small proportions of these errors (the aberrations of second order consisting in an incomplete or under-correction of the central part or toward the centre, and a corresponding over-correction toward the edge of the lens) will always remain, it follows from the foregoing conclusions that the amount of chromatic aberration of second order in an achromatic combination will be the smaller the greater the dispersive power of the flint glass employed. While thus the amount of chromatic aberration of a single or uncorrected lens depends with a given kind of glass on its focal power or focal length alone, and is to be corrected accordingly, its spherical aberration, however, depends also and in a higher degree on the form of the lens,—that is, on the difference of the curvatures of its surfaces,—and is the greater in amount the more said curvatures differ from each other. An equal-sided lens is, under ordinary conditions, of minimum, a meniscus—that is, a concavoconvex lens—of maximum spherical aberration. The spherical aberration of a positive lens may therefore be corrected by a negative lens of almost any focal power if the curvatures of the same can be made to differ sufficiently to produce an amount of spherical aberration equal to that of the positive lens. If, therefore, the positive lens is of minimum spherical aberration—that is, equal-sided, or nearly so—a negative meniscus of much lower focal power than that of the positive lens may correct said aberration, and since the difference of the focal powers of the components forms the focal power of the combination, the latter will in this case be comparatively great, or, *vice versa*, the focal power of the positive component will be comparatively small, and consequently the amount of spherical aberration to be corrected by the negative lens will be small, leaving a correspondingly small amount of aberration of second order. If, however, the positive lens of the combination is itself a meniscus,

as is the case with the photographic objective, then the focal power of its negative or correcting lens cannot be made to be much lower than that of the positive lens, or else it would be impossible to produce, even with the greatest admissible difference of its curvatures, the amount of negative spherical aberration required for the correction of the positive lens, and consequently the remaining focal power, respectively that of the combination, will be small in comparison with that of its positive component. Hence the focal power of the crown-glass lens in an achromatic meniscus of a given focal power is to be comparatively great, and being besides this a meniscus itself, its spherical aberration must be accordingly great, thus leaving a correspondingly great amount of aberration of second order after being corrected by the flint-glass lens.

Having thus pointed out the distinguishing characteristics of the two optical aberrations, and explained the proper mode of their correction, it remains to illustrate the principle after which both corrections are accomplished at the same time in the modern photographic objective.

Figure 1 of the accompanying drawings is a sectional view of a meniscus of the ordinary photographic objective, the components being cemented together. Fig. 2 shows a meniscus the spherical aberration of which is corrected by a negative lens made of a glass of equal refractive power to that of the positive lens, the components not being cemented together. Fig. 3 shows a cemented meniscus in which the chromatic but not the spherical aberration is corrected by a negative lens made of a high-dispersive flint glass. Fig. 4 represents an uncemented meniscus made of the same kinds of glasses as Fig. 3, but both the chromatic and the spherical aberrations being corrected. Fig. 5 is designed to demonstrate my novel way of so altering the form of the meniscus, Fig. 3, that both optical aberrations are corrected, and at the same time the components of the meniscus can be cemented together; and Fig. 6 shows the alteration completed, thus representing in sectional view my new photographic meniscus or objective. Fig. 7 is a longitudinal section of a compound photographic objective consisting of two meniscuses of my new type.

The meniscus, Fig. 1, is composed of a positive crown-glass lens *d* and a negative flint-glass lens *c*, the latter being of lower focal power than the crown-glass lens, thus leaving the preponderant part of the latter as the focal power or focal length of the combination. The facing sides *e* of the lenses are of equal radii of curvatures, and are cemented together, this arrangement being a necessity in photographic lenses. The fact that flint glass has not only a very high color-

dispersive power, but that also its medium refractive power is greater than that of crown glass, permits the cementing; otherwise the flint-glass lens would have to be of a still shorter meniscal curvature, so as to form a space between the lenses, as shown in Fig. 2, in order to produce with its lower focal power an amount of spherical aberration equal to that of the crown-glass lens.

Suppose now the flint-glass lens ϵ , Fig. 1, to be made of ordinary flint glass, such as is commonly used in telescope objectives and similar achromatic lenses. Then the internal sides ϵ , being, as may be assumed, of the proper though unusually short curvature as required in this case for the correction of the spherical aberration, will be much too short for the proper correction of the chromatic aberration, thus producing a corresponding over-correction of the same. If, then, the curve ϵ be flattened, the dispersion of both lenses will be reduced of course; but that of the flint-glass lens will diminish in a higher ratio than that of the crown-glass lens, owing to the higher dispersive power of the former, and thus a point will soon be reached at which the dispersive powers of both lenses are equal in amount, as required for the correction of the chromatic aberration. Fig. 3 is to illustrate this case, showing the inner curve ϵ as being considerably flatter than in Fig. 1 and of the proper radius for the purpose, as may be assumed. This change, however, interferes with the correction of the spherical aberration, which is thereby reduced to a corresponding under-correction, as is obvious.

It will now be readily understood that owing to the peculiarly conflicting relations and the distinguishing characteristics of the two aberrations, as shown, it is impossible to correct both aberrations of a crown-glass meniscus at the same time by the single means of a negative lens made of ordinary or any other high-dispersive flint glass in the manner described and illustrated by Figs. 1 and 3. Considering, however, the causes of this impossibility, as shown, it suggests itself that with a flint-glass of a certain low-dispersive power, or with two glasses of a correspondingly low difference of their dispersions, the desired result may be fully accomplished, and that such special properties of the glasses as required for the purpose may be accurately predetermined by calculation. This principle was discovered by the late mathematician, Steinheil, of Germany, many years ago, and has been ever since and up to the present time generally adopted by all the leading opticians in the world. In fact, it has been and is yet the basis *par excellence* for the construction of photographic objectives.

In my foregoing description of the optical aberrations I have shown that the amount of the chromatic aberration of second order in the achromatic lens will be the smaller the higher the color-dispersive power of the flint glass employed. The same is the case with the spherical aberration of second order, for, since the focal power, and with it the chromatic aberration of the crown-glass lens, are reduced by the use of high-dispersive flint glass, as I have shown, its spherical aberration must also be reduced in the proportion. Let us now apply these rules inversely to the modern photographic objective described, and it appears that, notwithstanding its valuable and superior properties, a serious defect is nevertheless inherent in the same, consisting in an excessive amount of aberrations of second order as an inevitable result of the employment of a flint glass of extremely low-dispersive power, and the reduction of this defect to an imperceptible minimum is the object of my improvement, which I describe as follows:

I employ in my new photographic objective the ordinary telescope flint glass, or even such of still higher dispersive power, and I form and arrange the whole in such a novel manner that both the spherical and the chromatic aberrations (of the first order) will be corrected at the same time. Thus I secure the great value lying in the employment of high-dispersive flint glass, and accomplish the desired purpose under full preservation of the advantages otherwise attained by the use of low-dispersive flint glass, as in the old meniscus described.

Let us refer again to the meniscus, Fig. 3 of the accompanying drawings, in which a flint glass of high-dispersive power is assumed to be employed, as described, and it will be remembered, as I have shown, that in this form of meniscus the correction of the chromatic aberration requires the internal sides e of the components d and c to be of much flatter curvature than those in Fig. 1, where a low-dispersive flint glass is employed, but that with such flat curvature the spherical aberration is only partly neutralized, respectively, under-corrected. A simple way, however, of completing the correction of the latter without disturbing that of the chromatic aberration will be to shorten the meniscal curvature of the flint-glass lens c under preservation of its focal power.

Fig. 4 represents the type of aplanatic meniscus thus formed, and, indeed, this form would be a great improvement over that now in general use were it not for the fact that the lenses cannot be cemented together, and thus the two surfaces e and g be allowed to cause reflections very injurious to the photographic image or picture. Let us therefore return to the meniscus, Fig. 3, and suppose the flint-glass

lens *c* to be flexible, the crown-glass lens *d*, however, to be in a fluid state. Let us further presume the whole to be inclosed in a vessel for the purpose of preserving the outer form of the meniscus. Let, then, the edge of the flint-glass lens *c* be bent off the side *b* of the vessel toward the side *a*, while the centre of the lens is held in its place against the side *b* of the vessel, as illustrated in Fig. 5, and indicated by the arrows. This operation will shorten the meniscal curvature of the lens and increase its negative spherical aberration without disturbing the chromatic correction of the combination. Let the operation be continued until the flint-glass lens has attained the form presented in Fig. 6, assuming that at this curvature the spherical aberration of the lens has reached the required amount. This is the point where both aberrations are corrected in the combination, and therefore the desired result is accomplished.

The form of the crown-glass lens *d* has, by the described operation, certainly been changed at the same time with the flint-glass lens, as will be seen, apparently and in fact being now of but little less aberration than the crown-glass lens *d*, Fig. 1; but the superfluous part of it has passed over to the other side of the flint-glass lens, forming there a new crown-glass lens *f*,—viz., a negative meniscus of nearly the form as if it had been directly separated from *d* by a cut. Thus these two lenses *d* and *f* present combined an amount of spherical aberration but little greater than that of the crown-glass lens *d*, Fig. 3, and much smaller than that of *d*, Fig. 1. Hence its correction by the flint-glass lens will leave an accordingly small amount of aberration of second order. Furthermore, it is obvious that the focal power, and consequently the dispersive power, of the combined crown-glass lenses *d* and *f* are also accordingly diminished as against that of *d*, Fig. 1, being much lower than the latter, and therefore a correspondingly small amount of chromatic aberration of second order will remain, as follows already from the simple fact that a high-dispersive flint-glass is employed, as shown before. Thus the object of my invention has been fully accomplished by the described transformation illustrated in Fig. 6, as will be clearly understood, and said diagram may therefore be regarded as being a true representation of my improved aplanatic meniscus, which, as will be seen, forms a triplet of a novel type, consisting of one positive and two negative meniscuses of such forms as to permit their cementing together, and being combined in such order that the concave side of the positive meniscus forms one and the convex side of one of the negative meniscuses the other side of the combination, and the sides or surfaces of said meniscuses being of such

proportional curvatures as to comply with the requirements of aplana-tism, permitting neither over nor under-correction of any of the optical aberrations to exist in the combination.

In conclusion, two practical advantages of my new triplet, over the ordinary meniscus, are as follows:

1. The flint-glass lens, being enclosed and protected by the crown-glass lenses, can be ground extremely thin, and thus its yellowish tint be made imperceptible.
 2. The flint-glass lens is completely protected against oxidation and mechanical injuries.
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ANNUAL CONVENTION OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

FIRST DAY, TUESDAY MORNING, JULY 14TH, 1891.

AT 9 A. M., more than a quorum being present, the convention was called to order by President Hastings, who introduced ex-President McMichael, who delivered the following

ADDRESS OF WELCOME.

Mr. President, Ladies and Gentlemen, Fellow Members of the P. A. A.:

In honoring the city of Buffalo, and especially the patrons of photography of this vicinity, by accepting an invitation to hold your convention for 1891 here, you express a trust that a hearty welcome will be given you. It has now become my duty as one of the resident members here to say a word in accord with that confidence implied in your acceptance, and to impress it that we—that all friends of your association in this city, where certainly there is no reason why you should have opponents,—have the liveliest feelings of gratitude that you have come among us, and we tender you our sincerest thanks for your presence, and felicitate ourselves in the belief that whatever may be the transactions of this meeting, in its results the greatest benediction will be ours.

We welcome you here, then, not only because your presence is eminently genial, and association with you is most happy, but also because we hope to be benefited by your counsel, your examples, and your instruction, both theoretical and practical.

We greet you as exemplars and improvers of one of the greatest, because one of the most beneficent, of arts, and as such it is a great happiness to have you unite with us in the present year's convention.

We need and welcome the inspiration to further advancement in our profession your presence at this time may be trusted to give us. Certainly, as photographers, we have great reason to take pride in our guild. In no other calling is there to be found greater inducement to make advancements. Whatever excellence we may be able to attain to-day is only a reason and encouragement to make greater improvement to-morrow. Our art is not an attempt to reproduce nature, but to exemplify all that nature suggests and teaches as possible to human effort. Nature needs no helpmate, but does welcome coöperation in enlisting man's admiration and man's enjoyment of existing things.

And so anything which helps to keep alive the features of departed friends helps also to continue to revive the best influences of their lives, and must consequently be beneficent in its effects.

The work of the photographer makes this beneficence universal, for in all homes, from the most luxurious to the most humble, it may be availed of at will. Though this is only one of its values, it alone is a reason why everything that may contribute to the improvement and perfection of our work should be sought. And if in other callings the workers find help by association for their mutual improvement, certainly our patrons and the public have a right to claim and expect that photographers should seek to learn by association with each other the best methods and the surest means to the best results in the pictures we produce for their approval.

All this is implied and emphasized in our organization, and so this convention is intended especially for business, and business always means short speeches and prompt action; heeding which fact, I close, simply but earnestly welcoming you all to Buffalo and our homes and hearts, and with the heartiest wishes that your meeting here will give occasion evermore for pleasant memories.

The next business in order, the roll call and the reading of the minutes of the last meeting, were dispensed with.

The next business, the report on the progress of photography, by Dr. H. H. Elliott, on account of the unavoidable absence of Dr. Elliott, was deferred until a later date.

The report of the committee on the Daguerre memorial was then read by Mr. McMichael. This showed that the total receipts had amounted to \$3,651.32.

DISBURSEMENTS.

Stationery	\$20 00
Postage	20 00
Journal	60
Cash Book	40
Receipt Books	31 50
Exchange	75
Wrapping Paper	1 00
Express	6 00
Gelatine Plates	6 00
Photogravure Co.	107 56
Circulars	10 00
Telegram	35
Circulars	1 60
Postage	3 50
Printing Large Envelopes	3 40
Expenses Attending Washington Convention	100 00
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Total	\$319 66
Receipts	\$3,331.66
Disbursements	319 66
Paid J. Scott Hartley	3,260 65

STATEMENT OF DAGUERRE MONUMENT ACCOUNT WITH J. SCOTT HARTLEY.

August and September, 1890, received payment	\$2,305 65
October 12th, 1890, " "	275 00
December 12th, 1890, " "	600 00
March 14th, 1891, " "	80 00
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Total	\$3,260 65
Minimum contract price	6,000 00
Paid	3,260 65
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Interest on 1st and 2d notes for \$700 up to July 1st, 1891 .	31 50
Interest on \$200 paid out, and \$300 due for granite . . .	22 50
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Balance still due J. Scott Hartley	\$2,793 35

After considerable desultory discussion, on motion of Mr. Carbutt the whole matter was postponed until the next meeting.

The question of selecting a location for the next meeting was likewise postponed until a better attendance should be present.

The committees on nominations and awards were appointed, after which the president read his annual report.

THE PRESIDENT'S ADDRESS.

To the Officers and Members of the P. A. of A.:

For this, the twelfth convention, we meet in annual session, to review the past and plan for the future. There is not much to be said except in repetition. The financial condition, January 1st, 1891, shows a balance of \$2,328.22 in the treasury. The amounts received up to this morning for this convention are as flattering as have been shown in the past, and give us reason to be assured that this year will be a financial success. The benefits to be derived from membership are seen every year by associating, observing, and putting together the facts gleaned at the annual conventions. Practical talks are much better for us than study of theory. To increase our membership is the one grand desideratum, and this cannot be done in an hour, but it can be attempted, and one way I shall suggest will be to stop the petty jealousies and inconsistent criticisms, and talk sense instead of continually finding fault without suggesting proper remedies. It is not claimed that this association is run on principles which cannot be improved upon, but with experience difficulties will be overcome. Remedies suggest themselves, and everything will become easier, and to a more practical condition. Let every one try to interest his or her neighbor to come into the association, showing the benefits to be derived therefrom, and it cannot be disputed that it will tend to multiply our ranks.

By a system of circulars, mailed so as to reach a great majority of photographers this year, we feel that a great deal of enthusiasm has been aroused, and that the results of the effort and expense of the same have contributed in a marked degree in making this convention one of large attendance and success.

The art principles we are trying to inculcate into our association by the awarding of special prizes, which will draw forth latent talent, embracing the ideal, poetic, and the art of composition, will be seen by continued competitions, and I think the public will appreciate and acknowledge it in an approving manner. Do not give up the idea that we are not able to conceive and execute in a manner which will give us a standing approaching a Messonier or any that might be named; we surely do not want to be simply machines, controlled by our patrons'

whims, but to rise higher and higher, and be accorded the praise and credit belonging to us. Many are in the work without any love for the art aside from getting a living, and too often those who are trying to reach the high standard desired are baffled thereby by lack of patronage, because the scum of the profession are working at an inconsistent remuneration. Merit will demand recognition, even though it may come slowly. Therefore, persevere, and the goal will be reached. Retrenchment has been called for in the expenses of this association, but in a three-years' service on the executive committee I fail to see any way in which any great saving can be accomplished. If you appropriate a less sum than one thousand dollars for awards and badges you will be unable to offer the special inducements which attract the attention of the workers, and make our art department less attractive and instructive than at present. The hall expense, which is quite an item, varies from year to year, and usually the committee are quite at the landlord's mercy, as it is seldom that more than one hall, appropriate for holding the convention, can be found in any city. The idea of merging the offices of secretary and treasurer into one can be done, but that would necessitate the creating of a new office,—that of third vice president, who could act as secretary during the business sessions of the convention; and yet our honored treasurer's book shows that for the past six years he has received only an average of \$288.61 per year, so that would not improve our condition to any great degree. A saving of about \$400 has been effected this year over our convention held in Boston on hall accommodations. A permanent home, recommended by my predecessor in office, is an idea well worthy your consideration, believing that even if the building is not owned by the association it can be leased and sublet so that a revenue would be received. It would be the storehouse for our donations, art works, records, etc. It would be less expensive for our stock dealers, as their spaces could be kept without the necessary expenses for refittings each year, as now. A proper light for the art department could be put in, so that all exhibitors would be placed on an equal footing regarding the lighting of their pictures. A studio, properly arranged for practical working, and which also could be used as an audience room, would, with a few other necessary arrangements, make a very complete home for this association. Our committee on this subject have reported.

I trust the project will not be abandoned, believing the records of this association too valuable to be at the mercy of the flames. I directed the secretary to deposit them in the Garfield Safe Deposit Vaults, in New York, at an expense of three dollars a year, which is

less than the amount paid for expressage, year by year, from secretary to secretary and convention meetings. Our association should be well represented at the World's Fair, and the committee in charge of arrangements ought not to leave a stone unturned to make it the grandest show of photography ever seen.

In our profession we are unjustly taxed for fire insurance, in that the rates established when (we will allow) the risk was more hazardous have not been decreased in proper proportion, and I think this association ought to raise its voice against such exorbitant rates, and act in accordance with such resolutions as may be passed with the proper authorities.

In conclusion, I wish to say that the exalted honor I have received by your suffrage, the courtesy and assistance rendered to me by the officers and members of the association, will ever be remembered with feelings of pride and pleasure, and I hope that my efforts to make this convention a success will be acceptable to the Photographers' Association of America.

This ended the first day's proceedings.

On Wednesday morning, July 15th, 1891, the convention was called to order by President Hastings, at 9 A. M.

Communications were read by the secretary from A. W. Motes, Atlanta, Georgia, and Mr. Appleton, from Dayton, Ohio, expressing their regrets at not being able to be present.

Under the head of new business, Mr. Clark introduced Mrs. L. A. Schooley, of Indianola, Iowa, as delegate of the Iowa Photographers' Association. The president of the Ohio State Association was also in attendance.

After a long discussion regarding membership and the initiation fee, and what would bring about a better attendance of the conventions, an amendment to the constitution was finally carried, providing for the next convention to be held in 1893, instead of next year, and making the regular annual dues sufficient until the next meeting two years hence. The secretary's and treasurer's commissions were also cut down from ten to five per cent.

Chicago was selected as the city for the next convention, and a committee appointed to demand from the authorities of the World's Fair Commission "a building specially adapted for an exhibit of photography."

Interesting papers were read by Miss Catherine Weed Barnes, Mr. John Carbutt, and Mr. G. Hanmer Croughton.

In the evening Mr. Charles Hetherington, of Chicago, endeavored to criticize, from an art standpoint, some slides which were to be thrown upon the screen for the purpose of instructing the photographers present in the rudiments of art. The attempt, however, degenerated into a complete fizzle.

On Thursday morning the convention was called to order promptly at 9.30 by President Hastings.

The first business was to read the

REPORT ON THE PROGRESS OF PHOTOGRAPHY.

BY DR. H. H. ELLIOTT.

Mr. President:—The task of making a report on the progress of photography has hitherto been one not fraught with unalloyed happiness for the individual who has undertaken it before this association. It is also a curious fact that the editors of photographic journals have always been selected to make this report. There is possibly a method in this selection, the officers of the association evidently believing that editors of journals are the only members of the fraternity having skins of sufficient thickness to stand the arrows of the critics of their work. I have on a previous occasion had to withstand these shafts. I know about how much they hurt, and am here again, ready to submit my effort to the same chances. But of one thing I am fully conscious, and that is that those who know the task will appreciate the difficulties and have a fair charity for my effort.

Beginning with the apparatus of the professional photographer, we do not find any important advances. The cameras that were used a year ago hold their places in the estimation of the practical man. In the matter of hand cameras we note some quite unique improvements. In this respect the new film camera, called the "Kameret," is undoubtedly a marked advance in the utilization of the space within the box to secure the most compact disposition of the parts. The roll is so arranged that it occupies the space between the cone of rays from the lens and the side of the box. By this method of disposition space hitherto not used has been made available, and the most compact hand camera now in the market is the result. Coming to the use of plates in hand cameras, we must give the palm to the new magazine camera of Anthony. This embodies several new devices that are quite ingenious. First, the plates are made to come into focus automatically by means of a spring, and after exposure a single push on a button takes the exposed plate out of the way into a well, leaving another plate in place for further use. Second, after all the plates in the magazine of the camera have been exposed, the camera may be loaded up

again by attaching a reservoir box to it containing a new lot of plates, which are readily transferred to the body of the camera by the use of a couple of slides. The empty box can now be used to hold the exposed plates in the camera, and these are removed by attaching it to the bottom of the camera, and with the movement of two slides the plates fall out, to give place to those that are to be exposed afterwards.

When we remember that all these transfers are accomplished in open daylight, we must confess that this is a decided advance in the construction of hand cameras. Yet another hand camera must take a little of our attention for a moment. This is the Hetherington. Here we have a camera using plates that are arranged pretty much as the leaves of a book. As each plate is exposed it is turned down out of the range of the lens, just as you would turn down the leaf of a book if it was stood up on its back, closed. Each plate is turned down, and a spring brings a new one into place. This is a most ingenious piece of apparatus, but as soon as the plates are all exposed you have to resort to a dark room to refill the plate-holders.

In the matter of lenses, by far the most important step has been taken by Carl Zeiss in the adaptation of the Jena glass to photographic lenses, and the construction of a lens in which the chemical and visual rays come to one and the same focus. Yet another improvement is the use of lenses so corrected that they may be used at very short focus and wide angle, without the distortion hitherto encountered in lenses of this character. There is no doubt that this Jena glass, which has done such wonders in the field of microscopy, is destined to teach us some new things in the world of photography.

While on the subject of lenses we must not forget to speak of the efforts of the English lens makers to come to some understanding in the matter of threads and flanges of the lens mounts. Although nothing definite has yet been accomplished, a report on the subject has been approved by the principal English lens makers, and with a little further modification there is no doubt that a uniform screw-thread for the lenses of the same size, also a uniform thread for tripod screws, and a uniform system of marking the diaphragms of lenses, will be adopted by all the English makers, and probably by those of America, France, and Germany. If this can be accomplished, the photographer will be in the same position as the microscopist in having all his lenses of the same size fit into the flanges on his cameras, or into adapters that also are uniform for all makes of lenses.

While we are noting the novelties in photographic apparatus, a word about the new rival of the photographic operator is worth our atten-

tion. We mean the automatic photographing machines, where you put a nickel in the slot, and get your picture taken, framed and all. But they are at present not worth more than a word, for all we have seen are easily distanced by the poorest tin-type artist that visits the smallest country town. Nevertheless these machines are the beginning of a series of inventions that will make a likeness of the sitter in front of them, and purely by mechanical motions, as certain in their action as those of a clock. At present they are more of a curiosity than an innovation in photographic work.

Since we last met quite a furore has been seen in the matter of color photography. Professor Lippman, of France, startled the world with the announcement that he had discovered the secret of taking photographs in their natural colors. After developments proved that he had repeated the experiments of Edmond Becquerel, made twenty-five years before, except that he had used glass plates with greater success. Practically his work is of little value, but it is interesting as a development of the theory of interference in light. The pictures he obtained are of the same character as the colors of the soap-bubble in the sunbeam or the film of oil on water.

Working in the same field of research, but with much better experience to guide him, our own Carey Lea has shown us some new wonders in the properties of silver chloride. Indeed, he has discovered that the basis of modern photography, the metal silver, is capable of existing in several distinct colored modifications. I cannot now take time to go into details upon this most interesting scientific development, and must content myself with referring my hearers to the photographic journals and the *American Journal of Science* for the past year.

The Austrian photographer, Verecsz, who also experimented in the field of color photography, did work that is but a modification of the work of Carey Lea.

Some means of determining the actinic value of light in its relation to photography has long been a desideratum, and the English experimenters, Messrs. Hurter and Driffield, together with Capt. Abney, have arrived at some interesting results, showing that the exposure determines the graduation of the lights and shades in the negative. Incorrect exposure will not give a harmoniously graded negative, and, furthermore, this incorrect exposure cannot be improved by a change of development. They have devised a method of determining the proper time of exposure, but at present the apparatus is more scientific than practical.

A much more convenient apparatus for the purpose of determining the time of exposure is the neat little actinometer of Ballard, which depends upon the measurement of the actinic power of the light on a subject by finding out how long the photographic—that is, the blue and violet—rays take to fade from a phosphorescent tablet that has been exposed to their influence. Its mode of operation is very simple. A small tube, blackened inside, has at one end a tablet of luminous paint, so arranged that it hangs by a hinge, which allows it to be exposed on the subject for half a minute. The tablet is then closed over the tube, and by looking into the latter the time of fading to a standard tint, also in the tube, gives a figure that is a measure of the photographic power of the light reflected by the subject. It is practical, and its indications are just as good as the sensitometer with which we determine the rapidity of our dry plates.

This same actinic power is modified by our use of the diaphragms in the lens. But here also some experiments of the past year have given us some new light. Dr. Michelke, of Germany, has shown that if we reduce the size of the opening in the lens to one-fourth, we shall have to increase the time of exposure not four times, as would be expected, but twenty per cent. more, or nearly five times. By using yet smaller openings we must add still more to the time; and with one-thirty-sixth of the opening, the time will have to be forty-eight times as long, or an increase of one-third the calculated time for correct exposures with a correspondingly larger stop. In a word, if the time of the exposure is correct with a stop of one inch, and it is desired to use a stop of one-quarter of an inch, we must increase the time of exposure not four times, but nearly five times.

In the field of orthochromatic photography, as it is called, there is not much new to report; but we are very glad to note that our American manufacturers are making some of the best dry plates of this kind to be found anywhere.

We are surprised that American photographers have not been more active in the adoption of these plates in their portrait work, for there is no doubt that they have an immense amount of retouching, not to speak of the better gradation of light and shade in the costumes on the sitters.

(*To be continued.*)

The only difference between the professional and amateur, according to the *Fliegende Blätter*, is that "an amateur photographs people as they are, a professional as they would like to be."

In the Twilight Hour.

THE great high road of human welfare lies along the old highway of steadfast well-doing, and they who are the most persistent and work in the truest spirit will invariably be the most successful.—*Samuel Smiles.*

THE Judaism of the future is not an unknown quantity; for if it be true to itself and the best utterances of sage and prophet, it will do its active share to spread the knowledge of God's unity and the brotherhood of humanity—the Jewish ideal and mission.—*Prof. Abram S. Isaacs.*

MEN'S creeds are generally in their heads, not often in their hearts, and hence there is often a disagreement between the head and the heart, and when this is the case, the heart should always have the benefit of the doubt. Its faith, hope, and love are instinctive, and "with the heart man believeth unto righteousness."—*Rev. Dr. J. Shrigley.*

CEREMONIES and arts were destined to touch the human heart, and call forth holy sentiments of love and admiration, in which the heart speaks to God, and which are as really part of our nature as reason itself. How even the silent temple in the dim twilight when no ceremony enlivens it, speaks to the soul and evokes its piety and its love of the beautiful.—*Archbishop Ryan.*

THE real problem of living is how to take what the hours bring. He who does this will live nobly and faithfully, and will fulfill God's plan for his life. The difference in men is not in the opportunities that come to them, but in their use of these opportunities. Many a man waits long for opportunities, wondering why they never come to him, when really they have been passing by him day after day, unrecognized and unaccepted.—*Rev. Dr. J. R. Miller.*

THE child born this morning lies surrounded by the mystery out of which it has come; the body of the old man who died yesterday lies awaiting its burial, and the mystery is there again. Between the two, life grows so often tame and commonplace that we tire of the thought of the sacredness of life, that we dare sometimes to think life tiresome.—*Dr. Phillips Brooks.*

WORSHIP need not be beautiful or aesthetic, but it should be decent. There need not be exquisitely modulated intonations or noble chants, but there must be reverence, or it is not worship at all. Eloquence is not worship, and muffled responses are not worship, and sweet music is not worship; nothing is worship that is not the expression of a broken and contrite heart which God will not despise.—*The Independent.*

THE CHILD'S FAITH.—The mystery in the Christian religion—an inevitable element in any religion which a reasonable being can accept, yet one by which so many men and women allow themselves to be disturbed—does not repel the child. He enjoys the mysterious. He grasps the truth at the heart of the mystery perhaps as readily as any of us, and its wrappings of indefiniteness and awe appeal to the same element in his nature which his fairy tales satisfy.—*The Congregationalist.*

IT is not the heights of the Church, and it is not the heights of this world, that is the scene of the greatest prosperity, but the soul over which the floods of sorrow have gone, the soul over which the freshets of tribulation have torn their way that yields the greatest fruits of righteousness, and the largest harvest for time, and the richest harvest for eternity. Bless God if your soul is "interval land."

—*George B. Stevens, D.D.*

—*From Religious Thought, in Public Ledger.*

RECENT PATENTS.

ISSUE OF JULY 14TH, 1891.

- 455,954—Photographic plates with emulsion, apparatus for cutting; J. H. Smith, Low Fell, Gates Head, England.

ISSUE OF JULY 21ST, 1891.

- 456,396—Photographic negatives, marking device for; B. A. Blackmore, Staunton, Va.

ISSUE OF JULY 28TH, 1891.

- 456,673—Photograph apparatus, coin-controlled; F. Martin, New York City, N. Y., assignor of one-half to P. V. W. Welch and W. F. Freeman, New York City, N. Y.

- 456,555—Photographers' retouching and marking apparatus; C. Cutler, Minneapolis, Minn.

- 456,842—Photographic camera; E. W. Perry, Jr., New York, assignor of one-half to E. Kipper, Adams, Mass.

- 456,869—Photographic exposures, instrument for calculating; A. Watkins, Hereford, England.
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The Photographic Herald.—As announced, our New York contemporary, *The Photographic Herald* for July was issued in an enlarged form. The publication is now under the editorial care of Mr. Laury MacHenry, and it is stated will cease to be a trade journal, the sole aim being from now on to cater to its patrons. A notice received just as we are going to press informs us that the *Photo-American Review* has been consolidated with the *Herald*, and that the combined publication will appear with the August number. We welcome the new periodical to the photographic field, and trust it may reap the success it deserves.

No Use Trying.—Photographer—"Can't you assume a more pleasant expression than that? Just think of your best girl a few minutes."

Young man (sadly)—"It wouldn't do any good. She refused me a week ago."—*Brooklyn Life*.

